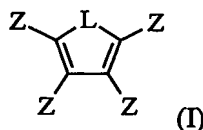


WHAT IS CLAIMED IS:

1. A compound comprising i) one or more dienophile groups (A-functional groups), ii) one or more ring structures comprising two conjugated carbon-to-carbon double bonds and a leaving group L (B-functional groups), and iii) one or more chemically bound mesogenic poragen forming moieties, characterized in that the A-functional group is capable of reaction under cycloaddition reaction conditions with the B-functional group to thereby form a cross-linked, polyphenylene polymer.

2. A compound according to claim 1 corresponding to the formula,



wherein L is -O-, -S-, -N=N-, -C(O)-, -(SO₂)-, or -OC(O)- ;

Z is independently in each occurrence hydrogen, halogen, an unsubstituted or inertly substituted hydrocarbyl group, Z''X, or two adjacent Z groups together with the carbons to which they are attached form a fused aromatic ring,

Z'' is a divalent derivative of an unsubstituted or inertly substituted hydrocarbyl group joining two or more structures of formula (I), or joining an A-functionality, a bound mesogenic poragen forming moiety, or a moiety comprising both an A-functionality and a bound mesogenic poragen forming moiety,

X is a second structure of formula (I), a moiety comprising A-functionality, a group comprising a mesogenic poragen forming moiety, or a moiety comprising both an A-functionality and a mesogenic poragen forming moiety

and in at least one occurrence, Z is a Z''X group of the formula: -Z''-C≡CM; or

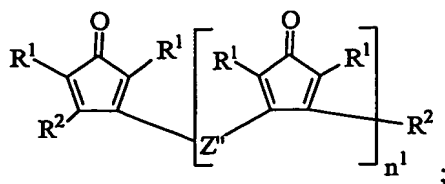
in at least one occurrence, Z is a Z''X group of the formula: -Z''-C≡CR and in at least one other occurrence Z is a Z''X group comprising a mesogenic poragen forming moiety;

wherein,

M is independently each occurrence a bound mesogenic poragen forming moiety; and

R is independently each occurrence selected from the group consisting of hydrogen, C₁₋₄ alkyl, C₆₋₆₀ aryl, and C₇₋₆₀ inertly substituted aryl groups.

3. A compound according to claim 2 corresponding to the formula:



wherein R^1 independently each occurrence is C_{6-20} aryl, C_{6-20} inertly substituted aryl, or R^2 ;

R^2 is C_{6-20} aryl- substituted ethynyl, $-Z''-M$, C_{6-20} aryl, or C_{6-20} inertly substituted aryl;

Z'' is a divalent linking group, and

5 M is a bound mesogenic poragen forming moiety,

n^1 is a number greater than or equal to zero;

with the proviso that in at least one occurrence R^1 or R^2 is C_{6-20} aryl- substituted ethynyl, and in at least one other occurrence R^1 or R^2 is $-Z''-M$.

4. A compound according to claim 3 wherein

10 R^1 and R^2 groups are independently selected from the group consisting of: C_{6-20} aryl- substituted ethynyl, $-Z''-M$, $-C\equiv C-M$, C_{6-20} aryl, and inertly substituted C_{6-20} aryl;

Z'' is selected from the group consisting of: phenylene, biphenylene, phenyleneoxyphenylene, ethynylene, -phenylene- C_{1-12} alkylene-, -phenylene- $O-C_{1-12}$ alkylene-, -phenylene- C_{1-12} alkylene- O -, -phenylene- $O-C_{1-12}$ alkylene- O -, -phenylene- CO -,
 15 -phenylene- O -, -phenylene- $OC(O)$ -, -phenylene- $C(O)O$ -, -phenylene- $C(O)-NH$ -,
 -phenylene- $NH-C(O)$ -, -phenylene- $OC(O)O$ -, -phenylene- $NHC(O)O$ -,
 -phenylene- $OC(O)NH$ -, -phenylene- $NHC(O)NH$ -, -phenylene- C_{1-12} alkylene- $C(O)O$ -,
 -phenylene- C_{1-12} alkylene- $C(O)NH$ -, -phenylene- C_{1-12} alkylene- $OC(O)$ -,
 -phenylene- C_{1-12} alkylene- $OC(O)NH$ -, -phenylene- C_{1-12} alkylene- $NHC(O)O$ -,
 20 -phenylene- C_{1-12} alkylene- $OC(O)O$ -, -phenylene- C_{1-12} alkylene- $NHC(O)NH$ -,
 -phenylene- $O-C_{1-12}$ alkylene- $C(O)O$ -, -phenylene- $O-C_{1-12}$ alkylene- $C(O)NH$ -,
 -phenylene- $O-C_{1-12}$ alkylene- $OC(O)$ -, -phenylene- $O-C_{1-12}$ alkylene- $OC(O)NH$ -,
 -phenylene- $O-C_{1-12}$ alkylene- $NHC(O)O$ -, -phenylene- $O-C_{1-12}$ alkylene- $OC(O)O$ - and
 -phenylene- $O-C_{1-12}$ alkylene- $NHC(O)NH$ -; and

25 M is a discotic mesogenic poragen forming moiety.

5. A cross-linked polymer formed by curing a composition comprising a compound according to any one of claims 1-4.

6. A porous matrix formed by removing of self-assembled poragens formed from bound mesogenic poragen forming moieties in the cross-linked polymer of claim 5.